The Application of Artificial Intelligence and Legal Analytics: Focused on Decisions Regarding Child Custody

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Abstract

The remarkable advances in artificial intelligence influences human lives in almost every aspect including business and academic research. For example, it became more and more common to use machine learning techniques to analyze, categorize texts and predict outcomes, which can assist human in making more accurate decisions. This research attempts to explore the possibility to apply artificial intelligence approaches to legal studies.

Firstly, this study introduces recent developments on artificial intelligence and the basic concepts regarding machine learning. Secondly, it explains how machine learning algorithms can be used to better predict legal outcomes. To demonstrate the strength of predictions, this article applies gradient boosting to analyze decisions related to child custody in Taiwan. We collected 448 cases from 2012 through 2014, involving 690 children whose parents were both Taiwanese and willing to acquire the custody, and in which the Taiwanese district court granted one parent sole custody. It is found that among factors enumerated in Article 1055-1 of Taiwan Civil Code, the three most important ones that judges consider are primary caregiver (gain=0.356), wishes of the child (gain=0.267), and parent-child interaction (gain=0.152). In terms of outcome predictions, the accuracy of the model is 95.7 % and F1 score is 0.927. The model built by gradient boosting could also demonstrate its application on individual cases – that is to say,

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it is able to reveal factors and how much they weighed on affecting the machine's prediction for a given case. By visualizing through waterfall charts, we may have a better understanding of criteria inside the machine's "mind".

This clearly illustrates in custody disputes what factors and to what extent judges consider important in Taiwan. In addition, this effective predictive model can help improve the predictability and certainly of law. Based on this, divorce lawyers can preliminarily assess their clients' chances at winning divorce lawsuits and propose the most optimal dispute resolution strategy. The informational asymmetries leading to wasteful expenditure on litigation may be reduced. In the long run, legal analytics can improve the acquirability and affordability of information about legal rights and responsibilities, which will enhance public trust and confidence in judicial system.

Keywords: artificial intelligence, machine learning, legal analytics, gradient boosting, child custody, best interest of the child, predictability of law